State of Utah

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Department of Administrative Services
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Executive Director

Division of Facilities Construction and Management
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Director

ADDENDUM

Date:	31 March 2006
To:	Consultants
From:	Bill Bowen, Program Director, DFCM
Reference:	Weber State University New Classroom Building & Central Chilled Water Plant
DFCM Project #:	05027810
Subject:	**Addendum No. 1**

Pages:		
	Addendum	1 page
	Programming Addendum	37 pages
	Total Pages	38 pages

Note: This Addendum shall be included as part of the Contract Documents. Items in this Addendum apply to all drawings and specification sections whether referenced or not involving the portion of the work added, deleted, modified, or otherwise addressed in the Addendum. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

1.1 Schedule changes: There are no schedule changes per this Addendum.

1.2 Reference the attached AJC Architects programming addendum dated December 2, 2005.

End of Addendum

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Humanities Building (Elizabeth Hall) Final Program Document Comments
December 2, 2005

Norm Tarbox Comments:

1. 1.2 Section 7.2 talks about the cost of relocating the tunnel. I presume this relocating it to the North of the humanities building? I thought we were looking at leaving the tunnel in place and designing around it. Is this $3/4 million included in the budget or is it and option at this point?

   Section 2.4.2 starting on page 24 addresses the utility tunnel options that were reviewed and discussed during programming. It covers 4 different options, and states that the preferred option is Option 1, which maintains the existing utility tunnels in place. It also states on page 26 that the construction estimate for the preferred option for the utilities, site work and new building construction are based on Option 1 maintaining the exiting utilities.

   Since we had to provide a cost estimate to relocate the utility tunnel, in order to see that it is too expensive of an option, we decided to locate this cost study in the Appendix section for future reference.

   I have revised the cover sheet in the Appendix Section 7.2 to state that the following cost estimate for relocating the utility tunnel is for documentation of the estimated costs. The preferred option is based on maintaining the existing utility tunnel and is what the Project Cost Summary in Section 5 is based on.

Warren Hill Comments:

1. Section 1, page 3. Under departments it says that TBE is just in building 2. TBE is in Buildings 2 & 4.

   I have revised Section 1 page 3 to state TBE is in Building 2 and 4. I have also revised Section 3 page 4.

2. Section 1, page 4. The net sq ft in Bldg 4 for TBE is 745 sq ft which makes their total 6,182 and the overall total 45,616.

   I have revised Section 1 page 4 to include building 4 at 745 SF and a new total of 45,616 SF.

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3. Section 2, page 3. In the first paragraph, it says our student body is 19,000. That should say 18,000.

I have revised Section 2 page 3 to 18,000.

4. Section 2, page 8. It shows parking lot A-4 next to the ET building. A-4 is next to the Science Bldg.

I have revised Section 2 page 8 map to show Lot A-4 further north.

5. Section 2, page 22. In the paragraph on gas service, it says that the gas line appears to serve buildings 1, 2, 3, and 4..... Either it does or it doesn't serve those buildings and others and we should know, not say that it *appears* to serve.....

The word "appears" is used because the information provided by the University does not confirm that it DOES serve buildings 1,2,3, and 4. As stated throughout the document, all utilities will need to be confirmed during design since the University has limited documentation available for programming. No change made to document.

6. Section 3, page 7. Again TBE is in Buildings 2 & 4 and sq ft numbers should be adjusted accordingly.

I have revised Section 1 page 4 to include building 4 at 745 SF and a new total of 45,616 SF.

7. Section 3, page 9. In the paragraph on general module design, the last sentence states that ...."the module system for an education building should *not* be determined in advance of design. This seems to contradict the first sentence which says that this building should be designed with a modular planning system. It seems confusing.

I have revised Section 3 page 9 by eliminating the last sentence.

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8. Section 3, page 11. First paragraph, second sentence the hyphen between 3 and levels should be removed as well as the comma after the word levels. In the second paragraph, I would change the first sentence to read .....appropriate for Humanities, being *used by all students* at Weber State.

I have made these revisions.

9. Section 3, page 12. The first paragraph on Natural Light and Views, first sentence, states that .....-in general nowhere in the building should be more ..... I would change this to read that - in general *all occupied spaces in the building should not* be more..... This statement is also redundant with the first statement under Internal Relationships on the previous page.

I have made these revisions.

10. Section 5, page 18. The bar graph for the Humanities Building is too long.

The bar graph has been revised.

Tom Van Cleave Comments:

1. Section 3 Page 21 - Design Conditions gives the elevation of the site as 4350' . It is actually closer to 4700'.

This revision has been made.

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2. I did not see any mention of enclosures or screen walls for the new transformer, medium voltage switches or generator.

Reference to providing screen walls has been added to Section 3 page 27.

3. Section 6.0 Page 1 "New Chiller" is a misnomer. It should be "New Chilled Water Plant".

This revision has been made to Section 6 and the Table of Contents.

4. On page 2 of the Construction Cost Estimate under "Electrical": Listing 4 chillers @ 1250 tons each is inconsistent with Option "A" which calls for 1- relocated 650 ton chiller, 1- 1250 ton relocated chiller and 2- 1500 ton chillers. This same section states that the chillers will be 4160 volt. Section 7.1A.1 of the Chiller Plant Study states that the new 1500 ton chillers be equipped with VFD's. Does anyone make a VFD that big????

The cost estimate has been revised.

Viron Lynch Comments:

1. Section 3.3.2 There should be a section that states that Weber State Universities building automation system (BAS) is Johnson Controls Metasys and that all HVAC, Refrigeration, lighting, utility metering, etc will be able to fully integrate with this system.

This additional information has been added to Section 3.3.2 page 21.

2. Section 3 page 23 Cooling System
Indicates that the chilled water piping will be tied into the existing piping system near the Bell Tower, this is not reflected in the Appendix 7.3 Section 3 Sheet Branch #1 & #2A Future. On this sheet the New Humanities Building chilled water connection is located at the Education Building.

This has been revised in Section 3 page 23.

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3. Section 3 page 26 Medium Voltage Distribution System
Provide electrical meter for facility. Meter must connect to BAS for remote reading, monitoring, and reporting and data collection. Meter must provide instantaneous KW and cumulative values.

Revisions have been made to Section 3 pages 26-27.

4. Section 3.3.3 Electrical
Provide electrical meter for facility. Meter must connect to BAS for remote reading, monitoring, and reporting and data collection. Meter must provide instantaneous KW and cumulative values.

Revisions have been made to Section 3 pages 26-27.

5. Section 3 Page 28 Standby Power Distribution System
Generator controls must interface with BAS for remote management, monitoring and data collection.

This additional information has been added to Section 3.3.2 page 21.

6. Section 3 Page 28 Outlets
Provide at least one 20A GFI outlet in all mechanical rooms.
Provide 20A GFI outlets within 25' of each piece of equipment on the roof.

This information has been added to Section 3 page 30.

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7. Section 3 Page 30 Lighting
Lighting shall be controlled through the BAS to meet the existing campus standard for monitoring/switching with positive feedback, scheduling and data collection.

This information has been added to Section 3 page 30.

8. Section 6 Page 26 Plumbing Systems
Chilled water Make-up system will be metered independently of other systems. Make-up meter must connect to BAS for remote reading, monitoring, and reporting and data collection. Meter must provide instantaneous flow in GPM and cumulative flows.

Cooling tower water Make-up system will be metered independently of other systems. Make-up meter must connect to BAS for remote reading, monitoring, and reporting and data collection. Meter must provide instantaneous flow in GPM and cumulative flows.

Water treatment system controllers will connect to the BAS for remote monitoring, alarming, reporting and data collection.

This information has been added to Section 6 page 26.

9. Section 6 Page 28 Electrical Systems
Provide electrical meter for facility. Meter must connect to BAS for remote reading, monitoring, and reporting and data collection. Meter must provide instantaneous KW and cumulative values.

This information has been added to Section 6 page 28.

10. Section 6 Page 29 lighting

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Lighting shall be controlled through the BAS to meet the existing campus standard for monitoring/switching with positive feedback, scheduling and data collection.

This information has been added to Section 6 page 29.

11. Section 6 Page 29 Outlets
Provide 20A GFI outlets within 25' of each piece of equipment on the roof.

This information has been added to Section 6 page 29.

12. Section 7 Page 3 Utility Tunnel Relocation
Should be High Pressure Steam Line, not High Temperature Hot Water

This revision has been made to Section 7 page 3.

13. Chilled Water Plant Study 4.3-3 paragraph 3
In paragraph 3 section a, the elevation difference between the first floor of the Skybox and the roof is 50 feet.

The document states that the height difference is first floor of Skybox = 4760 and approximate elevation of highest chilled water coil is 4810---which is 50 feet. All of this will be further measured and confirmed during design.

14. There is no reference to chiller #2, the Trane 1250 ton chiller being a 4160 volt chiller. Will it be relocated as is with the associated electrical equipment or will it be modified to 480 volt to match the new chillers?

This revision has been made to Section 6 pages 27-28.

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Al Talbot Comments:

1. All faculty and staff office, section 4, page 4, are show as being strongly adjacent to other faculty and staff offices on upper levels of the building. Is it possible to have one of those staff offices near the open 40-person computer lab listed, section 4, page 7, as being on the lower levels. Our open lab is managed by an instructor specialist and it would be helpful if the office for that person is located near the computer lab.

Yes-page 4 of the Program Spreadsheet has been revised to reflect this.

2. The two TBE work stations for work study-current, page 24, are both listed to be on the upper levels. Can one of these be on a lower level next to the 40-computer working lab along with the lab manager office area? The second work station for work study current should be next to the secretary office.

Yes-page 25 of the room sheet has been revised to include 1 of the work stations adjacent to the 40 person computer lab. The detail of the other work station being next to the secretary's will be worked out during design.

3. It is assumed that the secretary work station page 24 and the receptionist area, page 32 will be connected as one larger area. Is this a correct assumption?

Yes—this is also a detail that will be further developed during the design phase of the project when we look at the specific design of each individual space.

4. Section 4, page 6 lists TBE Audio Visual recording room, listed in detail on pages 90-91. Can that room be next to the teaching lab detailed on pages 94-95. Students will be going back and forth between those two rooms.

Yes-this adjacency has been revised on page 6 of the spreadsheet and page 91 of the room sheets.

5. TBE Computer equipment storage room, listed on page 4. I assume that room, the two TBE 40 computer labs, and the TBE 30-computer lab will be in very close proximity to each other.

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Yes—this is a correct assumption that will be further refined during the design phase of the project.

6. TBE 40-station Computer labs listed on page 4, and detailed on page 92-95. Will there be secure cabinets or cupboards in each of the lab rooms? I assume there will be great overhead lighting in the computer labs with direct sunlight blocked to prevent computer glare. Are these computer arrangements set or is that something that will be determined later. I am concerned about power sources for computer and internet sources. Will those sources be from the floors so seating must be established now. What is the line across the computer labs shown on page 92? One of those labs will be used extensively as a lecture lab so the arrangement shown would work fine assuming that power will also be provided for printers (not shown in diagram).

I am glad to see you thinking ahead for the details of this space. All of your concerns listed above will be completely refined during the design phase of the project. Yes, secure cabinets can be provided. Proper lighting and control of direct sunlight will be studied and designed to accommodate the functions of a computer lab. The computer station arrangement shown on the plan is just 1 solution---the actual layout will be determined during the design phase. The line across the center of the room on page 92 indicates that the room can be divided into two rooms.

7. The second 40-computer lab will be for helping students and testing purposes so it would be better for students and staff to have the computer face the long wall with the two doors. Printers will need to be added as will as a counter (desk) for lab aides, secure file cabinets for tests, power and internet source problems, etc. Power source for printers and scanners will need to be made available. It would be great to have a wall of windows separating about twelve computers to be used for testing only. Again is this something we need to worry about now or will these things be addressed later.

This level of thinking and design detail will be part of the future design phase. Once again, the arrangement of computer desks as shown in this document is just to show that we have the proper size room. The actual final layout and details for storage, power, windows etc. will be determined during the design phase.

8. TBE 30-computer lab detailed on pages 94-95. Concerns are with power source, power for two printersblack and white and a colored printer.

All of the required power will be detailed and provided during the design phase.

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1.3 Summary of Existing Facilities and Program

The essential mission of this project is to replace existing Building 1 and Building 2 with a new, multi-level, state-of-the-art research/learning facility. The following users currently occupy these buildings:

Current Building 1 Occupants
- Foreign Languages and Literatures
- Geography
- Air Force ROTC

Current Building 2 Occupants
- Foreign Languages and Literatures
- Telecommunication and Business Education (TBE)
- Printing/Newspaper

The new Humanities Building will have the following occupants:

Department	Current Location
English and Literature	Social Science, Annex 2, Annex 8
Communication	Building 3, Union, and Library
Foreign Languages and Literatures	Buildings 1 and 2
Telecommunications and Business Education (TBE)	Building 2 and 4

Geography will be relocated to the vacated space of English in the Social Science Building.
Air Force ROTC will be relocated to an Annex Building.
Printing will be relocated to the Stores and Receiving Building.

Department	Current Location	Square Feet Presently Used
English and Literature	Social Science	10,944 Net Square Feet
	Annex 2	1,378 Net Square Feet
English as a Second Language (ESL)	Social Science	1,244 Net Square Feet
	Annex 8	2,512 Net Square Feet
	Sub Total	*16,078 Net Square Feet*

Communication	Building 3	8,976 Net Square Feet
	Union	1,561 Net Square Feet
Multi Media Services	Library	5,167 Net Square Feet
	Sub Total	*15,704 Net Square Feet*

Foreign Languages and Literatures	Building 1	6,319 Net Square Feet
	Building 2	1,333 Net Square Feet
	Sub Total	*7,652 Net Square Feet*

Telecommunications and Business Education (TBE)	Building 2	5,437 Net Square Feet
	Building 4	745 Net Square Feet
	Sub Total	*6,182 Net Square Feet*

Total Existing Square Feet Presently Used	**45,616 Net Square Feet**

1.4 Project Justification-New Humanities Building

Existing Building 1 and Building 2 are two of the original buildings at Weber State University. These buildings were constructed in 1954, and have had minimal upgrades over the years. The buildings have antiquated mechanical and electrical systems, are not completely ADA accessible, contain asbestos, and are seismically unsafe for their current occupancy classification of A-3. In summary, the buildings have out-performed their life expectancy, and the cost to renovate/remodel would not be practical.

The existing Building 1 is approximately 15,533 gross square feet, and Building 2 approximately 16,894 gross square feet, for a total of 32,427 gross square feet on 1 level. The new Humanities Building will have the opportunity of multiple levels, providing a larger building in the same amount of space, yielding a greater use of prime real estate located in the center of campus.

The Humanities Departments of English, Communication and Foreign Languages and Literatures are currently located in 8 different buildings on campus. Part of the Vision and Mission for Humanities is to provide space that is interdisciplinary, where faculty, staff and students from different departments can interact. The new Humanities Building will provide an opportunity for 4 departments to be located in one building, allowing for this interaction and interdisciplinary approach to learning. Clustering humanities

2.0 SITE ANALYSIS

2.1 SITE LOCATION

2.1.1 MAIN CAMPUS LOCATION

Weber State University is a four-year institution of higher education located in Ogden, Utah. Its focus is providing undergraduate and selected masters programs of the highest educational quality. WSU offers over 200 separate degrees and programs—the largest and most comprehensive undergraduate program in the State of Utah. The University has a student body of 18,000 drawn predominantly from the Wasatch Front, but also includes students from 50 states and 34 foreign countries. Weber State University takes pride in its student-centered environment for learning and believes that quality undergraduate education is founded upon close associations between faculty and students.

The proposed location for the new Humanities Building is the current location of Buildings 1 and 2. Buildings 1 and 2 are located in the center of campus, just north of the Central Quad Area and Stewart Bell Tower.

To the east of Buildings 1 and 2:	Buildings 3 and 4 Stewart Library Building
To the south of Buildings 1 and 2:	Stewart Bell Tower Shepard Union Building
To the west of Buildings 1 and 2:	Student Service Center Building Wattis Business Building McKay Education Building
To the north of Buildings 1 and 2:	Parking and Open Space

See the **Overall Campus Map** and **Aerial Photo.**

LOT A-4

LOT A-5

LOT A-3

LOT A-2

BUILDING 2

BUILDING 1

LEGEND

VEHICULAR CIRCULATION

PEDESTRIAN CIRCULATION

SURROUNDING BUILDINGS

N

200' 0' 200' 400'

Scale: 1" = 200'

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EXISTING CIRCULATION - PEDESTRIAN AND VEHICULAR
Humanities Building

Program Document

Current Building 2 Occupants
- Foreign Languages and Literatures
- Telecommunication and Business Education (TBE)
- Printing

The new Humanities Building will have the following occupants:

Department	Current Location
English and Literature	Social Science, Annex 2, Annex 8
Communication	Building 3, Union, and Library
Foreign Languages and Literatures	Buildings 1 and 2
Telecommunications and Business Education (TBE)	Building 2 and 4

Geography will be relocated to the vacated space of English in the Social Science Building.
Air Force ROTC will be relocated to an Annex Building.
Printing will be relocated to the Stores and Receiving Building.

3.1.2 JUSTIFICATION

Existing Building 1 and Building 2 are two of the original buildings at Weber State University. These buildings were constructed in 1954, and have had minimal upgrades over the years. The buildings have antiquated mechanical and electrical systems, are not completely ADA accessible, contain asbestos, and are seismically unsafe for their current occupancy classification of A-3. In summary, the buildings have out-performed their life expectancy, and the cost to renovate/remodel would not be practical.

The existing Building 1 is approximately 24,300 gross square feet, and Building 2 approximately 18,300 gross square feet, for a total of 42,600 gross square feet on 1 level. The new Humanities Building will have the opportunity of multiple levels, providing a larger building in the same amount of space, yielding a greater use of prime real estate located in the center of campus.

The Humanities Departments of English, Communication and Foreign Languages and Literatures are currently located in 8 different buildings on campus. Part of the Vision and Mission for Humanities is to provide space that is interdisciplinary, where faculty, staff and students from different departments can interact. The new Humanities Building will provide an opportunity for 4 departments to be located in one building, allowing for this interaction and interdisciplinary approach to learning. Clustering humanities departments of the college also is more effective to administer, to facilitate cooperation and staff assignments, to share facilities such as conference rooms, large meeting rooms, etc. Currently, three humanities disciplines are located in four separate buildings (Social Sciences, Buildings 1, 2, 3). A new building is a propitious opportunity to bring together these three related disciplines that report to one dean/college.

3.14 HISTORY AND GROWTH

Department	Current Location	Square Feet Presently Used
English and Literature	Social Science	10,944 Net Square Feet
	Annex 2	1,378 Net Square Feet
English as a Second Language (ESL)	Social Science	1,244 Net Square Feet
	Annex 8	2,512 Net Square Feet
	Sub Total	*16,078 Net Square Feet*
Communication	Building 3	8,976 Net Square Feet
	Union	1,561 Net Square Feet
Multi Media Services	Library	5,167 Net Square Feet
	Sub Total	*15,704 Net Square Feet*
Foreign Languages and Literatures	Building 1	6,319 Net Square Feet
	Building 2	1,333 Net Square Feet
	Sub Total	*7,652 Net Square Feet*
Business Education (TBE)	Building 4	745 Net Square Feet
	Sub Total	*6,182 Net Square Feet*
Total Existing Square Feet Presently Used		45,616 Net Square Feet

Growth

The Program spreadsheet has a total of 52,854 Net Square Feet assigned to English and Literature, Communication, Foreign Languages and Literatures and Telecommunications and Business Education. This

Telecommunications and Business Education

Faculty	9
Staff	1
Adjunct Positions	23
Student Enrollment (Majors)	134

Expansion: The new Humanities Building has not been programmed for future building expansion. It is anticipated that the future expansion needs will not be to the new Humanities Building; rather expansion needs will be accommodated in the future new building that will some day replace Buildings 3 and 4.

General Module System Design: The new Humanities Building should be designed, as far as possible, with an economical, repetitive modular planning system. This system should be used for all building systems in an integrated design strategy including structural, MEP and architectural systems.

Building Module Planning/Flexibility Short-term Flexibility: Utilize movable partitions where possible to allow for changing room sizes. Use movable furniture unless built-ins provide a significant advantage. Provide for ongoing changes to all major systems and spaces. All MEP systems maintenance items shall be accessible and capable of replacement without demolition of architectural systems. Utilize drywall construction for partitions that are easily removed and replaced. Oversize elevators, corridors and key doorways to accommodate movement of large items of equipment. Plan the building architectural and MEP systems with a consistent modular strategy that allows for change without disrupting adjacent spaces.

Building Module Planning/Flexibility Long-Term Flexibility:
Consider the possibility of change, both within the current program and to different programs. For any sloped-floor teaching space, plan for future conversion to a flat-floor space without seriously disrupting building functions.

Space Type Summary: The types of spaces to be provided in the new Humanities Building are as follows:

Administration Space

Offices (Enclosed)	93 Total
Offices (Open Work Stations)	15 Total
Shared Adjunct Offices (Open Work Stations)	24 Total
Storage Rooms	4 Total
Tutoring Rooms	3 Total
Conference Rooms	2 Total
Small Adjunct Meeting Rooms	3 Total
Shared Faculty Work Rooms	3 Total
Shared Faculty Break Rooms	2 Total
Shared Student Lounge	1 Total

3.2 ARCHITECTURAL PLANNING ISSUES

3.2.1 BUILDING FORM AND MASSING

Quality and Image: The designated location for the new Humanities Building is where Buildings 1 and 2 are currently located. It is the intent for the new building to occupy the approximate area of the existing buildings. However, the new Building is programmed for 3 levels, therefore allowing a larger building than the existing square feet of Buildings 1 and 2.

The location of the building is essentially the center of campus, which is appropriate for Humanities, being used by all students at Weber State. The new Humanities Building will also be located adjacent to the Central Quad. Therefore, the architectural image of this building should be significant for both its location and long term durability. The new building should blend in with the traditional architecture of the buildings located around the site, as well as explore new and modern day materials that are found on some of the recent buildings completed on campus.

It would be anticipated that brick masonry would be the dominant exterior material. But the use of concrete, glass and metal would also be appropriate. Due to the types of spaces programmed, extensive use of glass for day lighting and views would also be appropriate.

Building Space Utilization Efficiency: The Program spreadsheet uses a net-to-gross efficiency ratio of .65. This is typical and appropriate for classroom and administration buildings. The areas not included in the net square footage are:

Restrooms
Circulation
Walls, Columns, Structure and Partitions
Unassigned Storage and Maintenance Areas
Stairs
Elevators
Mechanical, Electrical and Communication Shafts and Spaces

3.2.2 INTERNAL RELATIONSHIPS

Maximize Natural Light into Occupied Spaces: As far as possible every space shall have natural light and views- in general all occupied spaces in the building should not be more than 35' from natural light.

Low-Rise Construction: Maximize walk-up opportunities with limited use of elevators required to access classrooms and heavily used spaces. Large classrooms and specialty labs should be located on the first two levels, with smaller classrooms and seminar rooms located on the third level.

Administration spaces should be located on the second and third levels.

Student oriented spaces should be located on the first level.

3.2.3 NATURAL LIGHT AND VIEWS

As far as possible every space shall have natural light and views- in general all occupied spaces in the building should not be more than 35' from natural light.

The building shall take advantage of daylight to promote connection to the exterior natural environment. Day lighting is to be incorporated into the design of spaces to supplement and supplant artificial lighting.

Daylight should be integrated into building circulation to reinforce connections to the exterior and relieve interior spaces.

Views as identified are to be incorporated into the design of the building. The goal is to take advantage of these views from the most public areas of the building.

3.2.4 CIRCULATION

Internal Circulation

Maximize interactions and efficiency by utilizing "branching" single corridors/routes wherever possible in lieu of multiple parallel corridors/routes.

Locate discussion areas outside classrooms along the internal circulation paths, to promote participation of students and faculty.

Locate interior entry lobby in close relation to outdoor public spaces, to strengthen the indoor/outdoor relationship and encourage activities to continue from one space to the other.

Locate high use areas such as the Student Lounges in central circulation nodes, for ease of access and maximum chance of encounters.

External Circulation

Use outdoor pedestrian pathways in combination with outdoor public spaces, to allow for a maximum number of casual encounters with students and faculty, and to provide continuity and sense of place within the "Education Corridor."

Locate pathways as an organizing way finding device for building entries.

Use deciduous trees and landscaping to delineate pathways, and have shade in the summertime.

3.2.5 PERSONNEL INTERACTION

In the true interdisciplinary character of the facility, interaction among the following groups should be encouraged to the highest degree possible:

Other Shapes and Plates	ASTM A36
Steel Tube Columns	ASTM A500 Grade B (46 ksi)

Miscellaneous
Blast loading was not a required design parameter for this project.Future expansion of the building was not a design parameter for this project and is not anticipated.

3.3.2 MECHANICAL, Plumbing and Fire Protection

General Mechanical
The design and construction of the Humanities Building at Weber State University shall comply with the current Utah State Division of Facilities and Construction Management's updated Design Criteria as well as the current Weber State University Design Standards.

The mechanical and plumbing systems for the buildings shall be energy conserving and suitable for the building occupancy. Systems and equipment shall have a proven history of providing efficiency and optimal energy conservation. Per the Governor's directive, the building systems shall be 20% more energy efficient than current codes.

Automatic temperature controls shall be suitable for the building systems and occupancy. The control system shall be an electronic DDC system tied into the Johnson Metasys central campus control system. The new controls shall be 100% compatible and integrated with the existing campus system.

Weber State University's building automation system (BAS) is Johnson Controls Metasys and all HVAC, refrigeration, lighting, utility metering, generator controls, etc will shall be designed to fully integrate with this system.

Provide complete operation and maintenance manuals at the completion of the project as well as a complete set of record drawings and specifications.

All equipment shall be clearly labeled. Equipment, piping and ductwork shall be painted and labeled as required by the Weber State University design guidelines.

Design Conditions
The mechanical system shall be designed to maintain comfort condition in accordance with the Utah State Energy Code, DFCM A/E Design Guide, and WSU Design and Construction Standards.

Elevation:	+/- 4700 ft.
Lat / Long.	41°15' N, 111°57' W

Ambient: (ASHRAE 2-1/2%, 97%)

Summer	95°F DB 65°F WB
Winter	5°F DB

- Utah State Division of Facilities and Construction Management (DFCM) – Architect / Engineer Design Guide.
- Weber State University Design Guide

Heating, Ventilating and Air Conditioning

The building shall be heated, cooled, and ventilated with systems suitable for the building function and occupancy in accordance with ASHRAE and DFCM standards. HVAC systems must compare with other mechanical systems designed for classroom and administration areas. The primary mechanical system for the Humanities building shall be VAV with reheat.

Heating System

Heating source shall be campus supplied high pressure steam. Steam pressure shall be reduced at a PRV station at the building, and connected to a plate and frame heat exchanger with a 1/3 and 2/3 control station. Steam shall be converted to 180°F heating water and shall be distributed through a two pipe, direct return system to the building. Hot water pre-heat coils shall be installed at air handling units, and hot water re-heat coils shall be installed at the VAV boxes.

The hot water pumps shall be designed with 100% redundancy. The hot water system shall consist of hot water distribution pumps, standby pumps, variable frequency drives, pre-heat coil circulating pumps, air eliminator, and expansion tank complete with automatic make-up water system. The entire hot water system shall be controlled by a DDC control system, and completely integrated into the existing campus central control system. Provide a building steam meter to measure instantaneous flows (in BTUH), as well as cumulative flows (in BTU's). Flow meter shall have a manual reading at the building, as well the ability to communicate readings via the central control system.

The existing condensate pump below building #1 serves all 4 buildings. The existing low pressure condensate piping from buildings 3 and 4 shall be tied into the new condensate pump for the Humanities Building. Provide two new condensate pumps for redundancy. The condensate pump shall be a steam powered condensate pump with no electrical requirements. Existing condensate pump shall be salvaged to the owner.

Cooling System

Cooling source shall be chilled water provided by the central chiller plant. Chilled water piping shall be routed from the tunnel between the Educational Building and the Business Building. See campus chilled water survey for tunnel piping modifications required to accommodate this new load. Building chilled water loop shall consist of a building chilled water pump with a variable frequency drive, air eliminator, and expansion tank. In addition, provide an automatic bypass 3-way valve upstream of the chilled water pump. This valve shall be controlled by the BMS. It shall bypass the pumps when the central pumping system is capable of meeting the chilled water demand. This shall be measured by chilled water return temperature. When the campus pumping system cannot meet the building chilled water demand, the bypass shall open to the pump, and the building chilled water pump VFD shall modulate to meet demand.

The fire alarm contractor shall provide a "dry" set of contacts to tie into the central campus annunciator panel.

All fire rated doors shall be supplied with a magnetic door hold open that is tied into the fire alarm system. Upon activation of a fire alarm or power failure, they shall release.

The contractor shall provide documentation of the acceptability of all fire-safing materials used.

3.3.3 ELECTRICAL

Codes and Standards

Codes, which are applicable to the design of the electrical systems, are listed below. Comply with each of the latest adopted publications:

ADA, Americans with Disabilities Act
ASHRAE 90.1 Energy Code
EIA/TIA, Electronics Industries Association/Telecommunications Industry Association
IBC 2003, International Building Code
IEEE 1100-1999, Recommended Practice for Power and Grounding Electronic Equipment
IESNA, Illuminating Engineering Society of North America
NFPA, National Fire Protection Association (applicable sections including but not limited to):
- NFPA 70, National Electrical Code
- NFPA 72, National Fire Alarm Code

UL, Underwriter's Laboratories
Utah State Fire Marshal Laws, Rules and Regulations
DFCM, Division of Facilities Construction and Management, Design Criteria
Weber State University Design Guidelines

Site Utilities

Medium Voltage Power Distribution System

Existing five (5) way medium voltage switch is to be replaced with a new six (6) way medium voltage SF6 switch. The new switch should be installed on grade outside of the building. Existing switch is tied to building #4, building #2, union building #1, student services building and a spare switch. Weber State University prefers the new switch to be manufactured by S&C. Spare switch can be utilized temporarily to provide power to new on grade switch to reduce length of power outages. This will allow existing feeder cables to be extended to new switch one at a time. New switch must be located close to where existing is to reduce or eliminate number of splices.

The medium voltage switch, which provides power to new Humanities building, must have fuse protection.

Existing three (3) 167 kva single-phase medium voltage transformers are to be replaced with a new pad-mounted transformer (approximately 1,000 kva). New pad-mounted transformer is to be located next to the Medium Voltage Switch.

The new medium voltage switch should provide power to a new oil-filled, air-cooled, pad-mounted transformer. Primary voltage for new transformer should be 12,470 volt Delta; secondary voltage should be 480/277 volts 3-phase WYE connection. All exterior electrical equipment such as transformers, switches and transformers-to be screened (screen walls). Provide electrical meter for facility. Meter must connect to BAS for remote reading, monitoring, and reporting and data collection. Meter must provide instantaneous KW and cumulative values.

Telecommunication Distribution

The MDF room in the new Humanities building should have connections to the campus distribution network. A total of four (4) 4" conduits should run from this building to existing utility tunnel. MDF room should be located in close proximity to the existing utility tunnel.

Telecommunication work should comply with the Weber State University telecommunications design standards and all work should be coordinated with Weber State University telecommunications.

Powers Distribution Systems

Existing main distribution switchboard is old and parts are hard to find. Under this project, the entire switchboards, panelboard, feeder conduit and conductors should be removed and replaced with new equipment.

The main electrical room should be constructed to house a 480/277-volt and a 208/120-volt main distribution switchboard.

This room should be located as close as possible to the pad-mounted high voltage transformers to reduce the length of feeder conduit and conductors.

The 480/277 volt main distribution switchboard should be free standing and equipped with Square D. "Powerlogic"- type digital metering and should be tied to the campus central power monitoring system via a data line.

The 480/277 volt main distribution switchboard should be utilized to provide power to branch lighting panelboards, 480 volt machines, elevators, and large mechanical equipment such as air handlers, pumps, chillers, fans, etc.

The 208/120 volt main distribution switchboard should be utilized to provide power to branch power distribution panelboards for computer equipment, owner furnished equipment, duplex outlets, small mechanical equipment, etc.

Electrical rooms should be constructed on each floor to house the 480/277-volt and 208/120-volt branch panelboards.

Electrical rooms should be stacked on top of each other to reduce length of feeder runs.

Electrical rooms should have a minimum of 25% additional space for future growth.

Mechanical: Provide at least one 20A GFI outlet in all mechanical rooms. Provide 20 A GFI outlets within 25' of each pieces of equipment on the roof.

Grounding: Grounding Conductors

Grounding conductors should be installed with all feeder and branch circuits. Provide a grounding riser system throughout the telecommunication rooms with grounding bus bars mounted on the wall in each room.

Lighting

General

Lighting design should comply with illuminance levels and uniformity criteria of IESNA and its recommended practices. Comply with RP1-93 "Office Lighting", RP3-00 "Lighting for Educational Facilities", and RP-33-99 "Lighting for Exterior Environments". Except for specialized applications, design lighting with a minimum efficacy of 64 lumens per watt. Specify maximum 20% THD electronic ballasts. In addition, design lighting with a CRI exceeding 82, except in storage, mechanical, electrical, and similar non-public applications. Where appropriate, different lamp types should be minimized. Use 4' T-8 lamps with CRI of 86 or greater wherever possible. Lamps should be specified to comply with EPA TCLP requirements.

Comply with ASHRAE 90.1 requirements, except that overall energy target requirements should be exceeded by 15%. Design lighting control to harvest day lighting where practical, to control based upon occupancy, and according to programmable scheduling as applicable to the application. Only campus standard lighting fixtures should be used for walkways, compatible with the campus surroundings. Exterior lighting should be controlled by combination photocell and time schedule.

Lighting shall be controlled through the BAS to meet the existing campus standard for monitoring/switching with positive feedback, scheduling and data collection.

Interior Lighting

In general, low-glare fluorescent lighting with electronic ballasts should be utilized. Pendant indirect lighting should be strongly considered, but must be carefully coordinated in rooms with projectors so that the fixtures will not interfere with the projected image. Select luminaries for areas where VDTs are planned which are designed to minimize veiling reflections, and provide multilevel lighting control and task lighting to reduce the illuminance on the VDT. In addition, in rooms with audio/visual, provide lighting with variable or switched levels as indicated with a separate controlled zone to reduce glare and illuminance on the audio/visual display. In rooms with projectors, provide a separate bank of lighting control switches or station near the instructor position for ease of controlling lighting during presentations. Comply with RP-3-00 for classroom lighting, except increase illuminance to 75 fc (variable). Comply with RP-1-93 for office lighting.

Occupancy sensors should be used for the appropriate applications and control for daylight harvesting. Specify dual technology ceiling mounted directional sensors in private offices and classrooms with manual off-switches. Ultrasonic sensors should be in restrooms. Programmable lighting control with manual timed overrides should be in all common areas such as open offices, corridors, lobbies, and similar areas.

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Rough-Order-of-Magnitude (ROM) Spaces Program
1-Oct-05

	Function Area		Space Name	Description	Notes	Adjacency	Building Level	Occ #	SF / P	NASF	#	Program NASF
D.	Telecommunications and Business Education (TBE)											
1	Administration Offices	a.	Private Office	Department Chair	Individual private office with meeting space for 2-3 in office.	Strong Adjacency: All TBE Department Administration Spaces Secondary Adjacency: English, Foreign Languages and Communication Administration Spaces	Upper Level(s)	1	180	180	1	180
		b.	Private Office	Faculty Office- Current	Individual private office	Strong Adjacency: All TBE Department Administration Spaces Secondary Adjacency: English, Foreign Languages and Communication Administration Spaces + 1 office near 40 person TBE computer lab	Upper Level(s) + 1 office adjacent to 40 person computer lab on lower	1	120	120	8	960
		c.	*Private Office*	*Faculty Office-Growth*	*Individual private office*	Strong Adjacency: All TBE Department Administration Spaces Secondary Adjacency: English, Foreign Languages and Communication Administration Spaces	Upper Level(s)	*1*	*120*	*120*	*2*	*240*
		d.	Administration Support	Secretary Work Station	1 full time secretary/ receptionists.	Strong Adjacency: All TBE Department Administration Spaces Secondary Adjacency: English, Foreign Languages and Communication Administration Spaces	Upper Level(s)	1	81	81	1	81
		e.	Reception Waiting Area	Reception Area	Open space with chairs for seating	Strong Adjacency: All TBE Department Administration Spaces Secondary Adjacency: English, Foreign Languages and Communication Administration Spaces	Upper Level(s)	8	15	120	1	120
		f.	Work Study	Work Station for Work Study-Current	5 Part-time works study students--space to accommodate up to 2 people.	Strong Adjacency: All TBE Department Administration Spaces Secondary Adjacency: English, Foreign Languages and Communication Administration Spaces	Upper Level(s)	1	81	81	2	162
2	Administration Support Spaces	a.	General Storage	Secure Storage Room	General storage.	Strong Adjacency: All TBE Department Administration Spaces Secondary Adjacency: English, Foreign Languages and Communication Administration Spaces	Upper Level(s)	1	150	150	1	150
		b.	Computer Equipment Storage	Secure Storage Room	Storage for computer equipment.	Strong Adjacency: All TBE Department Administration Spaces Secondary Adjacency: English, Foreign Languages and Communication Administration Spaces	Upper Level(s)	1	150	150	1	150
					TBE Department Sub Total NSF						17	2,043
					TBE Department Total GSF (ASF / 0.65 Efficiency)							3,143
E.	Administration Support Spaces											
1	General Support/Shared	a.	Faculty Workroom	Room with work surfaces, cabinets and storage	Copy machines, fax, printers, scanners, work surfaces for collating and sorting, mail distribution.	Strong Adjacency: All Administrative Spaces	If three-levels, 1 per each level	12	25	300	3	900
		b.	Break Room/Faculty Lounge	Break Room	Microwave, fridge, sink, place to sit and eat lunch.	Strong Adjacency: All Administration Spaces	Upper Level(s)	12	25	300	2	600
		c.	Conference Room	Conference Room	To be used as a conference room and also as a formal meeting space.	Strong Adjacency: All Administration Spaces	Upper Level(s)	20	30	600	2	1,200
		d.	Shared Office	Adjunct	Open space for work stations to be shared by adjunct faculty. Approximately 60 adjunct faculty to share 10 open work stations. Adjunct faculty to use conference room as necessary to meet with students privately.	Strong Adjacency: All Administration Spaces	If three-levels, 1 per each level	8	81	648	3	1,944

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Rough-Order-of-Magnitude (ROM) Spaces Program
1-Oct-05

	Function Area		Space Name	Description	Notes	Adjacency	Building Level	Occ #	SF / P	NASF	#	Program NASF
2	Specialized Classrooms/Labs	a.	English/Commnication Multi Media Lab	Computer Lab	View demonstrations with screen in the front. Also to be utilized for Media Convergence.	Strong Adjacency: All Classrooms, Labs and Seminar Rooms Secondary Adjacency: Student Spaces	Large Classrooms and Labs located on first and second level. Smaller classrooms/seminar rooms on third level.	40	35	1,400	1	1,400
		b.	Tiered Classroom	Classroom	Place to hold poetry jams, visiting writers.	Strong Adjacency: All Classrooms, Labs and Seminar Rooms Secondary Adjacency: Student Spaces	Large Classrooms and Labs located on first and second level. Smaller classrooms/seminar rooms on third level.	200	15	3,000	1	3,000
		c.	Foreign Languages Media Learning Lab	Computer Lab	Space to accommodate 30 students with 30 computers. Needs to be able to be configured for different activities. Also to be used for oral testing.	Strong Adjacency: All Classrooms, Labs and Seminar Rooms Secondary Adjacency: Student Spaces	Large Classrooms and Labs located on first and second level. Smaller classrooms/seminar rooms on third level.	30	35	1,050	1	1,050
		d.	Electronic Media Production	Audio Recording Studio	Suitable for quality musical recordings and foley work as well as dramatic work and commercials, voice over (announcing) booth and audio control room (big enough for a class of 12-15 observing students)	Strong Adjacency: Electronic Media Production Video Equipment Storage and Check Out room and Video Editing Rooms Secondary Adjacency: Student Spaces and Communication Administration Space	Large Classrooms and Labs located on first and second level. Smaller classrooms/seminar rooms on third level.			1,000	1	1,000
		e.	Electronic Media Production	Video Field Equipment Storage Check-Out Room	Storage for video cameras, lighting equipment and tripods, plus a computer for logging student use of equipment, and a small test bench at one end for minor repairs, cleaning of equipment.	Strong Adjacency: Electronic Media Production Audio Recording Studio and Video Editing Rooms Secondary Adjacency: Student Spaces and Communication Administration Space	Large Classrooms and Labs located on first and second level. Smaller classrooms/seminar rooms on third level.			250	1	250
		f.	Electronic Media Production	Video Editing Rooms for Observation	Used for classroom instruction (up to 15 students observing)	Strong Adjacency: Electronic Media Production Video Equipment Storage and Check Out room and Audio Recording Studio Secondary Adjacency: Student Spaces and Communication Administration Space	Large Classrooms and Labs located on first and second level. Smaller classrooms/seminar rooms on third level.			200	1	200
		g.	Electronic Media Production	Video Editing Rooms	Used for editing video shot with the field equipment.	Strong Adjacency: Electronic Media Production Video Equipment Storage and Check Out room and Audio Recording Studio Secondary Adjacency: Student Spaces and Communication Administration Space	Large Classrooms and Labs located on first and second level. Smaller classrooms/seminar rooms on third level.			70	2	140
		h.	Special Use Lab	Communication Debate Lab	2 practice rooms and storage (Near Admin. Offices)	Strong Adjacency: All Classrooms, Labs and Seminar Rooms Secondary Adjacency: Student Spaces and Communication Administration Space	Large Classrooms and Labs located on first and second level. Smaller classrooms/seminar rooms on third level.			700	1	700
		i.	TBE Audio Visual Recording Room	Audio Visual Recording Room	Recording room with storage for AV equipment, blue screen.	Strong Adjacency: Teaching Lab Secondary Adjacency: Student Spaces	Large Classrooms and Labs located on first and second level. Smaller classrooms/seminar rooms on third level.	6	50	300	1	300

Room Name: **TBE**
Secretary Work Station
Work Study Work Station

1. SPACE PROGRAM:

General Space Description	Individual work station
Total New SF Area	81 NSF
Purpose of Space	Work area for 1 person
Number of Occupants	1
Hours and Days Used	8 am - 5 pm

2. PROXIMITY AND ACCESS REQUIREMENTS:

1 work station to be located on upper level (s) and adjacent to all TBE Department administration offices. 1 work station to be on lower level, next to 40 person computer lab.

3. ARCHITECTURAL CHARACTERISTICS:

Window	None
Doors	None
Floor	Carpet
Wall	None
Ceiling	Acoustical tile ceiling
Ceiling Height	10'-0"
Acoustics	None
General Character of Room	Work station

4. ENGINEERING SYSTEM:

Security	Standard
HVAC	Standard air exchange
Electrical	120V distributed to systems furniture
Plumbing	None
Lighting	Low-glare fluorescent fixtures
Phone/Data	Phone & data distributed to systems furniture w/ wireless capability
Special Requirements	None

5. EQUIPMENT, FURNITURE, AND AQCCESSORIES:

Systerms furniture w/ low panels, task chair

Room Name: **TBE Audio Visual Recording Room**

1. SPACE PROGRAM:

General Space Description	Audio visual recording
Total New SF Area	300 NSF
Purpose of Space	Recording room with storage
Number of Occupants	6
Hours and Days Used	Needs to accommodate extended hours

2. PROXIMITY AND ACCESS REQUIREMENTS:

Teaching lab & associated student spaces

3. ARCHITECTURAL CHARACTERISTICS:

Window	None
Doors	Yes 2, 3'-0" single leaf
Floor	Carpet
Wall	Gypsum board
Ceiling	Acoustical tile ceiling
Ceiling Height	10'-0"
Acoustics	Sound insulation in walls and on the wall surfaces
General Character of Room	Private, quiet

4. ENGINEERING SYSTEM:

Security	None
HVAC	Standard air exchange
Electrical	120V power wall outlets
Plumbing	None
Lighting	Low-glare fluorescen fixtures and incandescent dimmable fixtures
Phone/Data	Wall outlets, along with wireless capability
Special Requirements	None

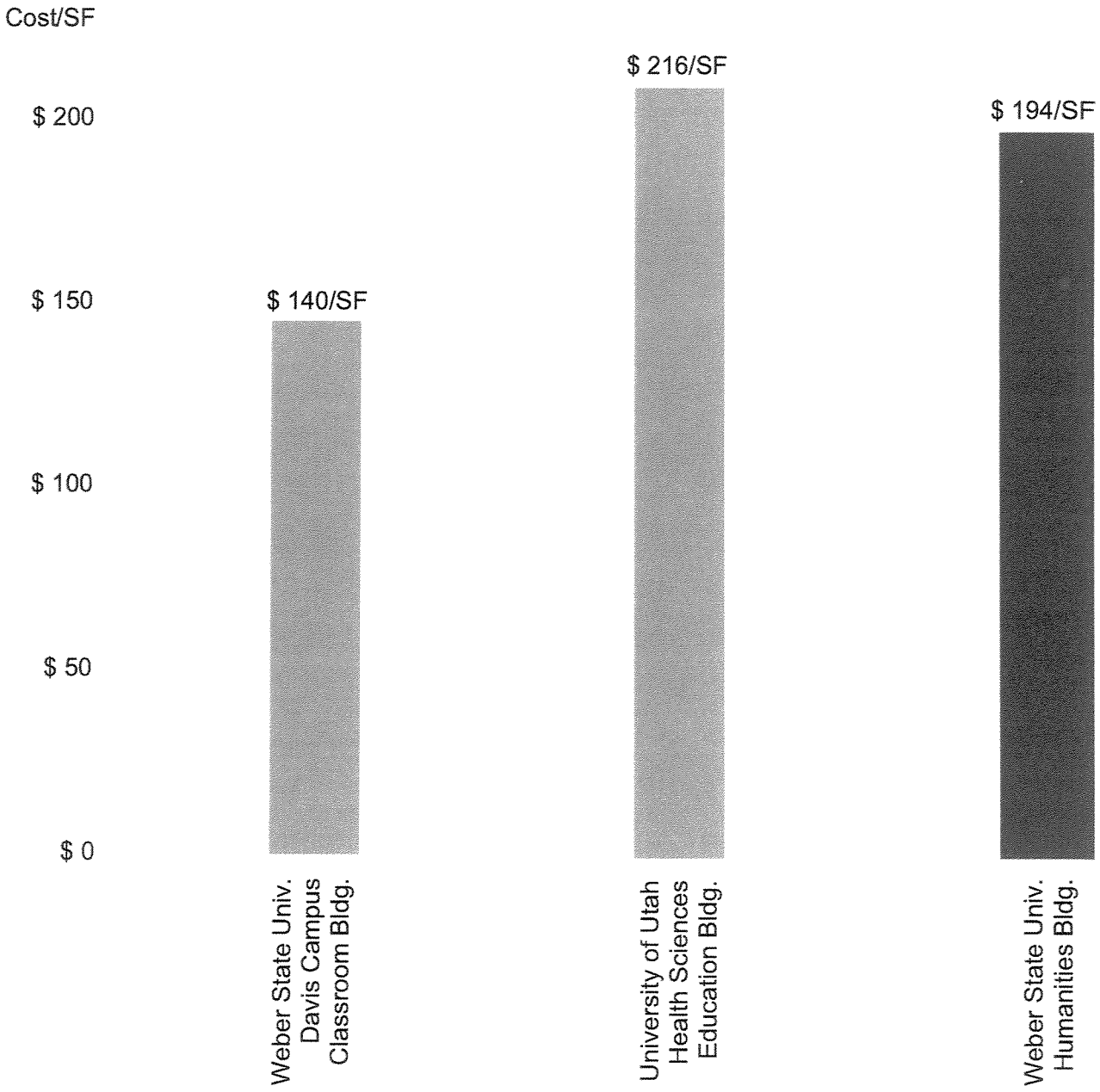
5. EQUIPMENT, FURNITURE, AND AQCCESSORIES:

Blue screen, storage for AV equipment

Cost Comparison Graph

Cost Comparison Graph Costs reflect the following:

- Building & Site Construction
- Comparables are inflated to 2005 dollars



6.0 NEW CHILLED WATER PLANT

6.1 INTRODUCTION

6.2 MECHANICAL EXECUITVE SUMMARY

6.3 PHYSICAL CHARACTERISTICS OF THE SITE

- 6.3.1 SITE LOCATION
  - OVERALL CAMPUS MAP
- 6.3.2 PHOTOS OF THE SITE
  - VIEWS OF THE SITE
- 6.3.3 GEOTECHNICAL INVESTIGATION REPORT
- 6.3.4 TOPOGRAPHY AND SURVEY
  - EXISTING TOPOGRAPHY PLAN
- 6.3.5 UTLITIES
  - PROPOSED UTILITY PLAN

6.4 CHILLER BUILDING

- 6.4.1 ARCHITECTURAL
  - ARCHITECTURAL SITE PLAN
- 6.4.2 STRUCTURAL
- 6.4.3 MECHANICAL
- 6.4.4 ELECTRICAL

6.5 CHILLER PROJECT COST SUMMARY

Provide a smaller roof mounted direct drive exhaust fan for the electrical room and restroom. Size per ASHRAE guidelines, and electrical room requirements.

Make-up Air:
Provide a wall mounted automatic damper/louver and interlock with the refrigerant exhaust system. General building exhaust air shall be made up through the fan coil units.

Controls Systems

Provide a DDC controlled building management system. BMS shall be fully integrated with the campus Johnson Metasys system. All HVAC components, including can coils, electric unit heaters, exhaust fans, etc. shall be tied into the DDC system.

Provide a separate DDC system for the new chiller plant, and all equipment associated with the new central plant. See the chiller study for further detail. The chiller plant DDC system shall also be fully integrated into the central campus Johnson Metasys system.

Plumbing Systems

Plumbing systems shall be designed to meet the International Plumbing Code as adopted by the State of Utah, D.F.C.M. Guidelines and Weber State University Design and Construction Standards. Provide ADA water closet and lavatory in uni-sex restroom. Provide utility sink in shop area. Provide electric tank type storage water heater for building, and locate in the shop area. Domestic water piping shall be type L copper, and waste piping shall be cast iron. Coordinate with civil site utilities to bring waste piping to building. Provide air compressor and compressed air piping in shop area.

Chilled water Make-up system will be metered independently of other systems. Make-up meter must connect to BAS for remote reading, monitoring, and reporting and data collection. Meter must provide instantaneous flow in GPM and cumulative flows. Cooling tower water Make-up system will be metered independently of other systems. Make-up meter must connect to BAS for remote reading, monitoring, and reporting and data collection. Meter must provide instantaneous flow in GPM and cumulative flows. Water treatment system controllers will connect to the BAS for remote monitoring, alarming, reporting and data collection.

Other Mechanical Systems

Provide all equipment associated with new chilled water plant. See the detailed chilled water study for further information. Chiller plant equipment shall include the following:

- Four water cooled chillers (two existing chillers will be re-located, two chillers will be new, and accommodations shall be made for 1 additional new chiller in the future)
- Chiller circulating pumps (one dedicated pump for each chiller)
- Two campus distribution chilled water pumps with variable frequency drives
- Two main condenser water pumps with variable frequency drives

- Plate and frame heat exchanger with dedicated chilled water circulating pump to serve chilled water loop with condenser water when temperature will allow
- Chiller make-up water and chemical treatment system
- Cooling tower make-up water and chemical treatment system
- Refrigerant Leak detection and evacuation system
- Chilled water piping sized to accommodate future 5th chiller, and tied into existing 24" piping under parking lot. See chiller study.
- Condenser water piping from existing cooling tower to new condenser pumps and new chillers
- Additional cooling tower cell

6.4.4 Electrical

Codes and Standards

Codes, which are applicable to the design of the electrical systems, are listed below. Comply with each of the latest adopted publications:

ADA, Americans with Disabilities Act
ASHRAE 90.1 Energy Code
EIA/TIA, Electronics Industries Association/Telecommunications Industry Association
IBC 2003, International Building Code
IEEE 1100-1999, Recommended Practice for Power and Grounding Electronic Equipment
IESNA, Illuminating Engineering Society of North America
NFPA, National Fire Protection Association (applicable sections including but not limited to):
NFPA 70, National Electrical Code
NFPA 72, National Fire Alarm Code
UL, Underwriter's Laboratories
Utah State Fire Marshal Laws, Rules and Regulations
DFCM, Division of Facilities Construction and Management, Design Criteria
Weber State University Design Guidelines

Site Utilities

Medium Voltage Power Distribution System

A new S&C PMH 4-way pad-mounted medium-voltage switch should be provided. The new switch should be tied to the existing S & C switch located to the North of the existing cooling tower building. Medium-voltage conductors between two switches should be installed in conduit and one spare conduit. The new medium voltage switch should provide power to a new oil-filled, air-cooled, pad-mounted transformer. Primary voltage for new transformers should be 12,470 volt Delta; secondary voltage for one transformer should be 480/277 volts 3-phase WYE connection and for second transformer should be 4160 volts, 3-phase. The 480 volt transformer should be sized larger so in the future when the relocated 1250 ton 4160 volt chiller is changed with the new one, there is adequate capacity.

Telecommunication Distribution

Two (2) 2" conduit should be installed between telephone terminal board in existing cooling tower building and telephone terminal board in new chiller building.

Power Distribution Systems

A new 4160 volt switch should be provided to supply power to relocated existing 1250 ton 4160 volt chiller. A new 480/277 volt main distribution switchboard should be provided. The 480/277 volt main distribution switchboard should be free standing and equipped with Square D. "Powerlogic"- type digital metering and should be tied to the campus central power monitoring system via a data line.

The 480/277 volt main distribution switchboard should be utilized to provide power to branch lighting panelboard, 480 volt mechanical equipment such as chillers, pumps, etc.

The 208/120 volt panelboard should provide power to computer equipment, owner furnished equipment, duplex outlets, small mechanical equipment, etc. Transient voltage surge suppressors should be provided for 480/277 volt main distribution switchboard and 208/120-volt panelboard.

All conductors should be copper. Conductors for branch circuits should be sized to prevent voltage drop exceeding 3% at the farthest point with 80% of circuit breaker demand load (duplex outlets, equipment, etc.). The total voltage drop on both feeders and branch circuits should not exceed 5%.

All conductors shall be installed in conduit. Minimum size of conduit to be ¾". Type MC cable may be used for light fixtures whip. Provide pull strings in all empty conduit.

A fault current and selective device coordination study should be done to indicate available fault current at all points in the 15 kV and building power distribution system. New switchboards, panelboards, etc., should be adequately rated for the available fault current. Fuses and circuit breakers should be selected to ensure minimum system power outage due to overloads or faults. Circuit breakers with adjustable long time, short time, instantaneous and/or ground fault setting shall be set at levels for optimum system coordination.

Mechanical equipment requiring variable frequency drives (VFDs) should comply with DFCM standards for VFDs included in the "Design criteria for Architects and Engineers" posted on the DFCM website.

Provide electrical meter for facility. Meter must connect to BAS for remote reading, monitoring, and reporting and data collection. Meter must provide instantaneous KW and cumulative values.

Standby Power Distribution System

Provide a standby diesel engine generator with a skid-mounted fuel tank and walk-around sound attenuated enclosure to support new building life safety equipment, mechanical control equipment, outlets by telephone terminal board, and other standby outlets as designated by Weber State University. Standby diesel engine generator should have approximately 20% excess capacity for future growth and flexibility.

New engine generator should be equipped with demand power meters alarm indicating control panel. Dry contacts should be available for remote monitoring of engine and fuel system alarms.

Fuel tank should be sized for 24 hours of engine operation at 100% load. University campus should have the ability to refill the tank during an extended commercial power outage.

Outlets
Locations and number of outlets should be coordinated for each space with Weber State University and comply with their needs and requirements. The following is to be used as general guidance:

Offices: For each workstation, provide two duplex outlets dedicated to computer terminals and one additional normal outlet for every 6' of wall space.

Counter tops (in general): One outlet every 4'; GFI where within 8' of a sink.

Telephone Terminal Board: Provide emergency outlets for equipment and a normal power duplex outlet for general-purpose use.

Restrooms: One GFI outlet near each lavatory counter top.

Storage Room: One duplex outlet.

Building Exterior and Roof: One WP/GFI outlet near each entrance. Provide 20A GFI outlets within 25' of each piece of equipment on the roof.

Grounding: Grounding Conductors
Grounding conductors should be installed with all feeder and branch circuits. A new isolated copper ground bus bar should be installed by telephone terminal board. Tie the copper bus bar to main ground bus bar in main distribution switchboard.

Lighting-General
Lighting design should comply with illuminance levels and uniformity criteria of IESNA and its recommended practices. Comply with RP1-93 "Office Lighting", RP3-00, and RP-33-99 "Lighting for Exterior Environments". Except for specialized applications, design lighting with a minimum efficacy of 64 lumens per watt. Specify maximum 20% THD electronic ballasts. In addition, design lighting with a CRI exceeding 86, except in storage, mechanical, electrical, and similar non-public applications. Where appropriate, different lamp types should be minimized. Use 4' T-8 lamps with CRI of 86 or greater wherever possible. Lamps should be specified to comply with EPA TCLP requirements.

Comply with ASHRAE 90.1 requirements, except that overall energy target requirements should be exceeded by 15%. Design lighting control to harvest day lighting where practical, to control based upon occupancy, and according to programmable scheduling as applicable to the application.

Only campus standard lighting fixtures should be used for walkways, compatible with the campus surroundings. Exterior lighting should be controlled by combination photocell and time schedule.

Lighting shall be controlled through the BAS to meet the existing campus standard for monitoring/switching with positive feedback, scheduling and data collection.

FINISHES			
Floor Finishes	5,300 SF	$4.00	$21,200.00
Wall Finishes	2,300 SF	$1.50	$3,450.00
Ceiling Finishes	800 SF	$3.00	$2,400.00
SPECIALTIES			
Cabinets and Casework	50 LF	$300.00	$15,000.00
Bath Accessories	1 EA	$2,000.00	$2,000.00
Misc. Specialties	5,300 SF	$1.50	$7,950.00
STRUCTURAL			
Concrete	1 LS	$85,000.00	$85,000.00
Metals	1 LS	$67,114.00	$67,114.00
MECHANICAL			
Mechanical Cooling Tower and Chiller (Option A)	1 LS	$3,662,320.00	$3,662,320.00
Mechanical HVAC and Plumbing	1 LS	$80,500.00	$80,500.00
ELECTRICAL			
2 relocated chillers and 2 1500 ton chillers 4160 volt power and associated pumps at 480 volts	1 LS	$324,500.00	$324,500.00
Electrical at Cooling Tower Addition	1 LS	$15,000.00	$15,000.00
SUB TOTAL			$4,537,284.00
GENERAL CONDITIONS	7%		$317,609.88
BONDING	1%		$45,372.84
OVERHEAD AND PROFIT	5%		$226,864.20
SUB TOTAL			$5,127,130.92
DESIGN CONTINGENCY	10%		$512,713.09
TOTAL (Construction) As of October 2005			$5,639,844.01

Notes: Costs are for Construction Only
Costs are based on a Competitive Bid Basis
Costs DO NOT include Inflation to Start of Construction
Mechanical costs for additional cooling tower includes masonry/concrete structure

7.2 COSTS TO RELOCATE THE EXISTING UTILITY TUNNEL

The following is the Cost Estimate for relocating the existing utility tunnel. The following cost estimate for relocating the utility tunnel is for documentation of these costs. The preferred option is based on maintaining the existing utility tunnel and is what the Project Cost Summary in Section 5 is based.

CONSTRUCTION COST ESTIMATE

SITE DETAIL

SECTION		QUANTITY	UNIT	UNIT COST	COST
UTILITY TUNNEL RELOCATION					
Concrete Utility Tunnel (New)		460	LF	800.00	$368,000
Chilled Water Line		460	LF	100.00	$46,000
High Pressure Steam Line		460	LF	250.00	$115,000
Condensate Line		920	LF	75.00	$69,000
					$598,000
SUB TOTAL					$598,000
GENERAL CONDITIONS	7.0%				$41,860
BONDING	1.0%				$5,980
OVERHEAD & PROFIT	5.0%				$29,900
SUB TOTAL					$675,740
DESIGN CONTINGENCY	10.0%				$59,800
TOTAL (Construction)					$735,540

NOTES: Costs are for Construction only.
Costs are based on a Competitive Bid Basis.
Costs are based on Current Costs and Do Not Included Inflation